REMARKS

Applicant respectfully requests reconsideration and allowance of the subject application. Claims 1, 12, 13, 21 and 24 are amended. Claims 1-26 are pending in this application.

35 U.S.C. § 102

Claims 1, 8, 9, 11, 12, 17, 19, 21 and 24

Claims 1, 8, 9, 11, 12, 17, 19, 21 and 24 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent Number 5,781,896 issued to Dalal (hereinafter "Dalal"). Applicant respectfully traverses the rejection.

Claim 1 has been amended to clarify that the partial aggregation is performed with respect to a single grouping column. Claim 1 now recites "a method for processing a database query," comprising: "partially pre-aggregating records in a database ***according to a single grouping column***" (amendment emphasized) "to provide a result that contains at least two records having like grouping column values." Claim 1 also recites the step of "aggregating records derived from the partial pre-aggregation to provide a result that contains records having unique grouping column values."

The gist of claim 1 is that a partial aggregation - i.e., an incomplete aggregation - may be performed as a preliminary step in a database query. Normally after an aggregation is completed, no two records contain a grouping column value that is the same as the grouping column value of another record.

However, as outlined in the specification, there is sometimes a benefit derived from aggregating groups of records before aggregating all of the records together. The final aggregation step eliminates multiple records having identical

grouping column values so, since the partial aggregation is merely an intermediate step, an acceptable result is ultimately obtained.

The Office Action states that the Dalal reference anticipates claim 1. Applicant disagrees. The reference does not support this statement. In the discussion of Fig. 10, the reference indicates that there are two grouping columns in the example shown. To-wit, "[t]he result table 1000 contains a Division grouping column, a Salesperson grouping column 1002. . . " and other columns. (col. 51-65)

The process described in Dalal is not a partial aggregation, but is more appropriately described as a "*multiple level aggregation query*." Dalal, column 9, lines 52-53. A multiple aggregation query is a query that utilized more than one grouping column, aggregating one grouping column at a time, sequentially. In the example described in Dalal, the Division grouping column is aggregated, then the result of that aggregation is aggregated according to the Salesperson grouping column. This does not disclose or anticipate a partial aggregation (or partial pre-aggregation).

The point of novelty described in Dalal is to perform a database query using references to database items rather than the database items themselves, so as to save a number of disk read and/or write operations. The reference does not describe partial aggregation.

Accordingly, claim 1 is not anticipated by Dalal and is allowable over the cited reference. The rejection, therefore, should be withdrawn.

Claims 8, 9 and 11 depend from claim 1 and are allowable by virtue of that dependency.

Claim 12 has been amended to recite a relational database system that includes, *inter alia*, a record store and a query processor configured "to process a

query on the record store according to a single grouping column, the query processor being configured to partially pre-aggregate the record store to provide a result that contains at least two data records that have like grouping column values."

As previously discussed in the response to the rejection of claim 1, a typical aggregation does not result in any two records having an identical grouping column value. According to the specification, a partial aggregation or pre-aggregation does not necessarily produce such a result. The operations referred to in Dalal are sequential aggregations - one follows the other. Dalal does not disclose or anticipate a partial aggregation or partial pre-aggregation.

Accordingly, claim 12 is allowable over the cited reference and the rejection thereof should be withdrawn.

Claims 17 and 19 depend from claim 12 and are allowably at least by the same reasoning discussed in the response to the rejection of claim 12. Therefore, the rejection of claims 17 and 19 should also be withdrawn.

Claim 21 has been amended and now recites a relational database computer program that comprises "partial pre-aggregation code to partially pre-aggregate data records according to grouping column values in a single grouping column to provide a partial pre-aggregation result having two or more records having like grouping column values." The relational database computer program also includes "aggregation code" that aggregates the result of the partial pre-aggregation.

As previously discussed, Dalal does not disclose or anticipate a partial pre-aggregation operation. Dalal merely discloses a multiple level aggregation.

Accordingly, claim 21 is allowable over the cited references and the rejection of claim 21 should be withdrawn.

Claim 24 recites a relational database computer program comprising computer-executable instructions that perform several steps. The steps include "aggregating the input records in the stream *according to a single grouping column*" (amendment emphasized) to create a record store, "joining records in the record store with other data," outputting the records from the join and aggregating the records output from the join. Claim 24 also makes clear that "the records output from the join include at least two records that have an identical grouping column value in the single grouping column." This restriction, in essence, renders the first aggregating step a partial aggregation.

As previously discussed, the cited reference only describes an aggregation or a multiple level aggregation, wherein no records output from an aggregation contain an identical value **in the grouping column**. The identical values cited in the Office Action are contained in a grouping column on which the aggregation was not performed. The operations disclosed in Dalal are merely typical aggregations that completely aggregate records on a grouping column so that no record resulting from the aggregation contains an identical value in the aggregated grouping column. This is contrary to claim 24.

Claim 24 clearly recited a partial aggregation that is not disclosed in any reference. As a result, claim 24 is allowable over Dalal and the rejection thereof should be withdrawn.

35 U.S.C. § 103

a. Claims 2-5, 13-15, 20, 22, 23 and 25 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Dalal in view of U.S. Patent Number 6,115,705 issued to Larson (hereinafter "Larson"). Applicant respectfully traverses the rejection.

Claims 2-5 depend from claim 1 and are allowable at least by virtue of that dependency for the reasons stated in the response to the rejection of claim 1. Neither reference teaches or suggests a partial aggregation or partial pre-aggregation. As discussed above, this makes the claims allowable over the cited references and the rejection of these claims should be withdrawn.

Claims 13-15 and 20 depend from claim 12 and are allowable at least by virtue of that dependency for the reasons stated in the response to the rejection of claim 12. The addition of Larson does not add anything to the previous discussion because Larson does not teach or suggest partial aggregation or partial pre-aggregation.

Accordingly, the rejection of claims 13-15 and claim 20 should be withdrawn.

Claim 22 and 23 depend from claim 21 and are allowable at least by virtue of that dependency for the same reasons set forth in the response to the rejection of claim 21, above. Accordingly, the rejection of these claims should be withdrawn.

Claim 25 depends from claim 24 and is allowable at least by virtue of that dependency for the same reasons set forth in the response to the rejection of claim 24, above. Accordingly, the rejection of claim 25 should be withdrawn.

b. Claims 6, 7, 10, 16, 18 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dalal in view of Larson and further in view of U.S. Patent Number 6,032,144 to Srivastava et al. (hereinafter Srivastava). These claims depend from claims that have been shown, above, to be allowable over Dalal. The addition of Larson and/or Srivastava to the analysis does not provide a reference that teaches or suggests partial aggregation or partial pre-aggregation.

Accordingly, these claims are allowable over the cited references and the rejection thereof should be withdrawn.

Conclusion

All pending claims 1-26 are in condition for allowance. Applicant respectfully requests reconsideration and prompt issuance of the subject application. If any issues remain that prevent issuance of this application, the Examiner is urged to contact the undersigned attorney before issuing a subsequent Action.

Respectfully Submitted,

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Version of Amended Claims With Markings to Show Changes Made

1. (Amended) A method for processing a database query, [according to at least one grouping column value, the method] comprising:

partially pre-aggregating records in a database according to a single grouping column to provide a result that contains at least two records having like grouping column values; and

aggregating records derived from the partial pre-aggregation to provide a result that contains records having unique grouping column values.

12. (Amended) A relational database system, comprising:

memory for storing a record store, the memory having a portion available for query processing;

a query processor coupled to the memory to process a query on the record store according to [at least one] a single grouping column[value], the query processor being configured to partially pre-aggregate the record store to provide a result that contains at least two data records that have like grouping column values; and

the query processor being further configured to aggregate data records resulting from the partial pre-aggregation to provide an aggregation result that contains data records, no two of the data records having [a] the same grouping column value.

13. (Amended) The relational database system as recited in claim 12, wherein the query processor being configured to partially pre-aggregate the record store further comprises the query processor being configured to:

maintain a record store in the volatile memory, the record store having one record for each different grouping column value encountered in the partial pre-aggregation;

receive an input record from the non-volatile memory;

combine the input record with a record in the record store that has the same grouping column value, if there is such a record; and

adding the input record to the record store if there is no record in the record store that has the same grouping column value as the input record.

21. (Amended) A relational database computer program embodied on a computer-readable medium, comprising:

partial pre-aggregation code to partially pre-aggregate data records according to grouping column values in a single[at least one] grouping column [value] to provide a partial pre-aggregation result having two or more records having like grouping column values; and

aggregation code to aggregate data records in the partial pre-aggregation result to provide an aggregation result having records with unique grouping column values.

24. (Amended) A relational database computer program stored on a computer-readable medium, the relational database computer program comprising computer-executable instructions that, when executed on a computer, perform the following steps:

receiving a stream of input records;

aggregating [each] the input records [record] in the stream according to a single grouping column as it is received to create a record store;

joining records in the record store with other data; [and]

outputting the records in the record store after the join; (7, 36-48) 705

aggregating the records output from the join; and

wherein the records output from the join include at least two records that have an identical grouping column value in the single grouping column. (5, 47-60)